SEQUENCE LISTING

<110> Croce, Carlo

<120> Nitrilase Homologs

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<140> 09/357,675
<141> 1999-07-20

<150> 60/093,350
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atccttcagc ttttggatcc attacaggcc cagcccactg ggaggtgttg ctgcgggccc 840
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<210> 3
<211> 21
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<213> Homo sapiens

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<210> 4
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<222> (0)...(0)
<223> n=a, g, c or t

<400> 4
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<210> 5
<211> 26
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<220>
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<222> (0)...(0)
<223> n=a,c,g, or t and y=c or t

<400> 5
acrtgnacrt gyttnacngt ytgngc 26

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<213> Drosophila melanogaster

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gcgcctttgt ggcctcgact g 21

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<400> 7
cggtggcgga agttgtctgg t 21

<210> 8
<211> 20
<212> DNA
<213> Caenorhabditis elegans

<400> 8
gtggcggctg ctcaaactgg 20

<210> 9
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tcgcgacgat gaacaagtcg g 21

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<400> 11
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<400> 13
aaactgaagc ctctttcctc tgac 24

<210> 14
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<400> 15
ctgggctgag cacaaagtac tg 22

<210> 16
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<212> DNA
<213> Homo sapiens

<400> 16
gcttgtctgg cgtcgatgtt a 21

<210> 17
<211> 36
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<213> Homo sapiens

<400> 17
tgacgtcgac atatgtcaac tctagttaat accacg 36

<210> 18
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<212> DNA
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<400> 18
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<210> 19
<211> 147
<212> PRT
<213> Homo sapien

<220>
<223> Xaa is an unknown amino acid

<400> 19
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1 5 10 15
Leu Lys Thr Glu Leu Ser Phe Ala Leu Val Asn Arg Lys Pro Val Val
20 25 30
Pro Gly His Val Leu Val Cys Pro Leu Arg Pro Val Glu Arg Phe His
35 40 45
Asp Leu Arg Pro Asp Glu Val Ala Asp Leu Phe Gln Thr Thr Gln Arg
50 55 60
Val Gly Thr Val Val Glu Lys His Phe His Gly Thr Ser Leu Thr Phe

65 70 75 80
Ser Xaa Gln Asp Gly Pro Glu Ala Gly Gln Thr Val Lys His Val His
85 90 95
Val His Val Leu Pro Arg Lys Ala Gly Asp Phe His Arg Asn Asp Ser
100 105 110
Ile Tyr Glu Glu Leu Gln Lys His Asp Lys Glu Asp Phe Pro Ala Ser
115 120 125
Trp Arg Ser Glu Glu Glu Glu Ala Ala Glu Ala Ala Ala Leu Arg Val
130 135 140
Tyr Phe Gln
145

<210> 20
<211> 150
<212> PRT
<213> murine

<400> 20
Met Ser Phe Arg Phe Gly Gln His Leu Ile Lys Pro Ser Val Val Phe
1 5 10 15
Leu Lys Thr Glu Leu Ser Phe Ala Leu Val Asn Arg Lys Pro Val Val
20 25 30
Pro Gly His Val Leu Val Cys Pro Leu Arg Pro Val Glu Arg Phe Arg
35 40 45
Asp Leu His Pro Asp Glu Val Ala Asp Leu Phe Gln Val Thr Gln Arg
50 55 60
Val Gly Thr Val Val Glu Lys His Phe Gln Gly Thr Ser Ile Thr Phe
65 70 75 80
Ser Met Gln Asp Gly Pro Glu Ala Gly Gln Thr Val Lys His Val His
85 90 95
Val His Val Leu Pro Arg Lys Ala Gly Asp Phe Pro Arg Asn Asp Asn
100 105 110
Ile Tyr Asp Glu Leu Gln Lys His Asp Arg Glu Glu Glu Asp Ser Pro
115 120 125
Ala Phe Trp Arg Ser Glu Lys Glu Met Ala Ala Glu Ala Glu Ala Leu
130 135 140
Arg Val Tyr Phe Gln Ala
145 150

<210> 21
<211> 327
<212> PRT
<213> Homo sapien

<400> 21
Met Leu Gly Phe Ile Thr Arg Pro Pro His Arg Phe Leu Ser Leu Leu
1 5 10 15
Cys Pro Gly Leu Arg Ile Pro Gln Leu Ser Val Leu Cys Ala Gln Pro
20 25 30
Arg Pro Arg Ala Met Ala Ile Ser Ser Ser Ser Cys Glu Leu Pro Leu
35 40 45
Val Ala Val Cys Gln Val Thr Ser Thr Pro Asp Lys Gln Gln Asn Phe
50 55 60

```
Lys Thr Cys Ala Glu Leu Val Arg Glu Ala Ala Arg Leu Gly Ala Cys
65                  70                  75                  80
Leu Ala Phe Leu Pro Glu Ala Phe Asp Phe Ile Ala Arg Asp Pro Ala
                85                  90                  95
Glu Thr Leu His Leu Ser Glu Pro Leu Gly Gly Lys Leu Leu Glu Glu
            100                 105                 110
Tyr Thr Gln Leu Ala Arg Glu Cys Gly Leu Trp Leu Ser Leu Gly Gly
        115                 120                 125
Phe His Glu Arg Gly Gln Asp Trp Glu Gln Thr Gln Lys Ile Tyr Asn
    130                 135                 140
Cys His Val Leu Leu Asn Ser Lys Gly Ala Val Val Ala Thr Tyr Arg
145                 150                 155                 160
Lys Thr His Leu Cys Asp Val Glu Ile Pro Gly Gln Gly Pro Met Cys
                165                 170                 175
Glu Ser Asn Ser Thr Met Pro Gly Pro Ser Leu Glu Ser Pro Val Ser
            180                 185                 190
Thr Pro Ala Gly Lys Ile Gly Leu Ala Val Cys Tyr Asp Met Arg Phe
        195                 200                 205
Pro Glu Leu Ser Leu Ala Leu Ala Gln Ala Gly Ala Glu Ile Leu Thr
    210                 215                 220
Tyr Pro Ser Ala Phe Gly Ser Ile Thr Gly Pro Ala His Trp Glu Val
225                 230                 235                 240
Leu Leu Arg Ala Arg Ala Ile Glu Thr Gln Cys Tyr Val Val Ala Ala
                245                 250                 255
Ala Gln Cys Gly Arg His His Glu Lys Arg Ala Ser Tyr Gly His Ser
            260                 265                 270
Met Val Val Asp Pro Trp Gly Thr Val Val Ala Arg Cys Ser Glu Gly
        275                 280                 285
Pro Gly Leu Cys Leu Ala Arg Ile Asp Leu Asn Tyr Leu Arg Gln Leu
    290                 295                 300
Arg Arg His Leu Pro Val Phe Gln His Arg Arg Pro Asp Leu Tyr Gly
305                 310                 315                 320
Asn Leu Gly His Pro Leu Ser
                325
```

<210> 22
<211> 323
<212> PRT
<213> murine

<400> 22

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Met Leu Gly Phe Ile Thr Arg Pro Pro His Gln Leu Leu Cys Thr Gly
 1               5                  10                  15
Tyr Arg Leu Leu Arg Ile Pro Val Leu Cys Thr Gln Pro Arg Pro Arg
            20                  25                  30
Thr Met Ser Ser Ser Thr Ser Trp Glu Leu Pro Leu Val Ala Val Cys
        35                  40                  45
Gln Val Thr Ser Thr Pro Asn Lys Gln Glu Asn Phe Lys Thr Cys Ala
    50                  55                  60
Glu Leu Val Gln Glu Ala Ala Arg Leu Gly Ala Cys Leu Ala Phe Leu
65                  70                  75                  80
Pro Glu Ala Phe Asp Phe Ile Ala Arg Asn Pro Ala Glu Thr Leu Leu
                85                  90                  95
Leu Ser Glu Pro Leu Asn Gly Asp Leu Leu Gly Gln Tyr Ser Gln Leu
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```
          100                 105                 110
Ala Arg Glu Cys Gly Ile Trp Leu Ser Leu Gly Gly Phe His Glu Arg
      115                 120                 125
Gly Gln Asp Trp Glu Gln Asn Gln Lys Ile Tyr Asn Cys His Val Leu
  130                 135                 140
Leu Asn Ser Lys Gly Ser Val Val Ala Ser Tyr Arg Lys Thr His Leu
145                 150                 155                 160
Cys Asp Val Glu Ile Pro Gly Gln Gly Pro Met Arg Glu Ser Asn Tyr
                165                 170                 175
Thr Lys Pro Gly Gly Thr Leu Glu Pro Pro Val Lys Thr Pro Ala Gly
            180                 185                 190
Lys Val Gly Leu Ala Ile Cys Tyr Asp Met Arg Phe Pro Glu Leu Ser
      195                 200                 205
Leu Lys Leu Ala Gln Ala Gly Ala Glu Ile Leu Thr Tyr Pro Ser Ala
  210                 215                 220
Phe Gly Ser Val Thr Gly Pro Ala His Trp Glu Val Leu Leu Arg Ala
225                 230                 235                 240
Arg Ala Ile Glu Ser Gln Cys Tyr Val Ile Ala Ala Ala Gln Cys Gly
                245                 250                 255
Arg His His Glu Thr Arg Ala Ser Tyr Gly His Ser Met Val Val Asp
            260                 265                 270
Pro Trp Gly Thr Val Val Ala Arg Cys Ser Glu Gly Pro Gly Leu Cys
      275                 280                 285
Leu Ala Arg Ile Asp Leu His Phe Leu Gln Gln Met Arg Gln His Leu
  290                 295                 300
Pro Val Phe Gln His Arg Arg Pro Asp Leu Tyr Gly Ser Leu Gly His
305                 310                 315                 320
Pro Leu Ser
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<210> 23
<211> 460
<212> PRT
<213> Drosophila melanogaster

<400> 23

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Met Ser Thr Leu Val Asn Thr Thr Arg Arg Ser Ile Val Ile Ala Ile
 1               5                  10                  15
His Gln Gln Leu Arg Arg Met Ser Val Gln Lys Arg Lys Asp Gln Ser
            20                  25                  30
Ala Thr Ile Ala Val Gly Gln Met Arg Ser Thr Ser Asp Lys Ala Ala
        35                  40                  45
Asn Leu Ser Gln Val Ile Glu Leu Val Asp Arg Ala Lys Ser Gln Asn
    50                  55                  60
Ala Cys Met Leu Phe Leu Pro Glu Cys Cys Asp Phe Val Gly Glu Ser
65                  70                  75                  80
Arg Thr Gln Thr Ile Glu Leu Ser Glu Gly Leu Asp Gly Glu Leu Met
                85                  90                  95
Ala Gln Tyr Arg Glu Leu Ala Lys Cys Asn Lys Ile Trp Ile Ser Leu
            100                 105                 110
Gly Gly Val His Glu Arg Asn Asp Gln Lys Ile Phe Asn Ala His Val
        115                 120                 125
Leu Leu Asn Glu Lys Gly Glu Leu Ala Ala Val Tyr Arg Lys Leu His
    130                 135                 140
```

```
Met Phe Asp Val Thr Thr Lys Glu Val Arg Leu Arg Glu Ser Asp Thr
145                 150                 155                 160
Val Thr Pro Gly Tyr Cys Leu Glu Arg Pro Val Ser Thr Pro Val Gly
                165                 170                 175
Gln Ile Gly Leu Gln Ile Cys Tyr Asp Leu Arg Phe Ala Glu Pro Ala
            180                 185                 190
Val Leu Leu Arg Lys Leu Gly Ala Asn Leu Leu Thr Tyr Pro Ser Ala
        195                 200                 205
Phe Thr Tyr Ala Thr Gly Lys Ala His Trp Glu Ile Leu Leu Arg Ala
    210                 215                 220
Arg Ala Ile Glu Thr Gln Cys Phe Val Val Ala Ala Ala Gln Ile Gly
225                 230                 235                 240
Trp His Asn Gln Lys Arg Gln Ser Trp Gly His Ser Met Ile Val Ser
                245                 250                 255
Pro Trp Gly Asn Val Leu Ala Asp Cys Ser Glu Gln Glu Leu Asp Ile
            260                 265                 270
Gly Thr Ala Glu Val Asp Leu Ser Val Leu Gln Ser Leu Tyr Gln Thr
        275                 280                 285
Met Pro Cys Phe Glu His Arg Arg Asn Asp Ile Tyr Ala Leu Thr Ala
    290                 295                 300
Tyr Asn Leu Arg Ser Lys Glu Pro Thr Gln Asp Arg Pro Phe Ala Thr
305                 310                 315                 320
Asn Ile Val Asp Lys Arg Thr Ile Phe Tyr Glu Ser Glu His Cys Phe
                325                 330                 335
Ala Phe Thr Asn Leu Arg Cys Val Val Lys Gly His Val Leu Val Ser
            340                 345                 350
Thr Lys Arg Val Thr Pro Arg Leu Cys Gly Leu Asp Cys Ala Glu Met
        355                 360                 365
Ala Asp Met Phe Thr Thr Val Cys Leu Val Gln Arg Leu Leu Glu Lys
    370                 375                 380
Ile Tyr Gln Thr Thr Ser Ala Thr Val Thr Val Gln Asp Gly Ala Gln
385                 390                 395                 400
Ala Gly Gln Thr Val Pro His Val His Phe His Ile Met Pro Arg Arg
                405                 410                 415
Leu Gly Asp Phe Gly His Asn Asp Gln Ile Tyr Val Lys Leu Asp Glu
            420                 425                 430
Arg Ala Glu Glu Lys Pro Pro Arg Thr Ile Glu Glu Arg Ile Glu Glu
        435                 440                 445
Ala Gln Ile Tyr Arg Lys Phe Leu Thr Asp Ile Ser
    450                 455                 460
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<210> 24
<211> 440
<212> PRT
<213> C. elegans

<400> 24

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Met Leu Ser Thr Val Phe Arg Arg Thr Met Ala Thr Gly Arg His Phe
 1               5                  10                  15
Ile Ala Val Cys Gln Met Thr Ser Asp Asn Asp Leu Glu Lys Asn Phe
            20                  25                  30
Gln Ala Ala Lys Asn Met Ile Glu Arg Ala Gly Glu Lys Lys Cys Glu
        35                  40                  45
Met Val Phe Leu Pro Glu Cys Phe Asp Phe Ile Gly Leu Asn Lys Asn
```

```
    50                  55                  60
Glu Gln Ile Asp Leu Ala Met Ala Thr Asp Cys Glu Tyr Met Glu Lys
65                  70                  75                  80
Tyr Arg Glu Leu Ala Arg Lys His Asn Ile Trp Leu Ser Leu Gly Gly
                85                  90                  95
Leu His His Lys Asp Pro Ser Asp Ala Ala His Pro Trp Asn Thr His
            100                 105                 110
Leu Ile Ile Asp Ser Asp Gly Val Thr Arg Ala Glu Tyr Asn Lys Leu
        115                 120                 125
His Leu Phe Asp Leu Glu Ile Pro Gly Lys Val Arg Leu Met Glu Ser
    130                 135                 140
Glu Phe Ser Lys Ala Gly Thr Glu Met Ile Pro Pro Val Asp Thr Pro
145                 150                 155                 160
Ile Gly Arg Leu Gly Leu Ser Ile Cys Tyr Asp Val Arg Phe Pro Glu
                165                 170                 175
Leu Ser Leu Trp Asn Arg Lys Arg Gly Ala Gln Leu Leu Ser Phe Pro
            180                 185                 190
Ser Ala Phe Thr Leu Asn Thr Gly Leu Ala His Trp Glu Thr Leu Leu
        195                 200                 205
Arg Ala Arg Ala Ile Glu Asn Gln Cys Tyr Val Val Ala Ala Ala Gln
    210                 215                 220
Thr Gly Ala His Asn Pro Lys Arg Gln Ser Tyr Gly His Ser Met Val
225                 230                 235                 240
Val Asp Pro Trp Gly Ala Val Val Ala Gln Cys Ser Glu Arg Val Asp
                245                 250                 255
Met Cys Phe Ala Glu Ile Asp Leu Ser Tyr Val Asp Thr Leu Arg Glu
            260                 265                 270
Met Gln Pro Val Phe Ser His Arg Arg Ser Asp Leu Tyr Thr Leu His
        275                 280                 285
Ile Asn Glu Lys Ser Ser Glu Thr Gly Gly Leu Lys Phe Ala Arg Phe
    290                 295                 300
Asn Ile Pro Ala Asp His Ile Phe Tyr Ser Thr Pro His Ser Phe Val
305                 310                 315                 320
Phe Val Asn Leu Lys Pro Val Thr Asp Gly His Val Leu Val Ser Pro
                325                 330                 335
Lys Arg Val Val Pro Arg Leu Thr Asp Leu Thr Asp Ala Glu Thr Ala
            340                 345                 350
Asp Leu Phe Ile Val Ala Lys Lys Val Gln Ala Met Leu Glu Lys His
        355                 360                 365
His Asn Val Thr Ser Thr Thr Ile Cys Val Gln Asp Gly Lys Asp Ala
    370                 375                 380
Gly Gln Thr Val Pro His Val His Ile His Ile Leu Pro Arg Arg Ala
385                 390                 395                 400
Gly Asp Phe Gly Asp Asn Glu Ile Tyr Gln Lys Leu Ala Ser His Asp
                405                 410                 415
Lys Glu Pro Glu Arg Lys Pro Arg Ser Asn Glu Gln Met Ala Glu Glu
            420                 425                 430
Ala Val Val Tyr Arg Asn Leu Met
        435                 440
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<210> 25
<211> 471
<212> PRT
<213> unknown

<220>
<223> conserved sequence of human, murine, D. melanogaster and C. elegans Nit1

<221> UNSURE
<222> (6)...(6)
<223> Xaa = unknown amino acid

<221> SIGNAL
<222> (363)...(363)
<223> Xaa = stop signal

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<221> SIGNAL
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<223> Xaa = stop signal

<400> 25

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Pro Leu Ala Ala Ala Xaa Leu Ala Pro Asp Arg Pro Pro Asp Arg Thr
 1               5                  10                  15
Leu Arg Met Val Leu Ala Ile Ser Ser Cys Arg Thr Tyr Ser Leu Ser
            20                  25                  30
Arg Arg Pro Arg Leu Gly Phe Ile Thr Arg Pro Pro His Arg Phe Leu
        35                  40                  45
Ser Leu Leu Cys Pro Gly Leu Arg Ile Pro Gln Leu Ser Val Leu Cys
    50                  55                  60
Ala Gln Pro Arg Pro Arg Ala Met Ala Ile Ser Ser Ser Ser Cys Glu
65                  70                  75                  80
Leu Pro Leu Val Ala Val Cys Gln Val Thr Ser Thr Pro Asp Lys Gln
                85                  90                  95
Gln Asn Phe Lys Thr Cys Ala Glu Leu Val Arg Glu Ala Ala Arg Leu
            100                 105                 110
Gly Ala Cys Leu Ala Phe Leu Pro Glu Ala Phe Asp Phe Ile Ala Arg
        115                 120                 125
Asp Pro Ala Glu Thr Leu His Leu Ser Glu Pro Leu Gly Gly Lys Leu
```

```
    130                 135                 140
Leu Glu Glu Tyr Thr Gln Leu Ala Arg Glu Cys Gly Leu Trp Leu Ser
145                 150                 155                 160
Leu Gly Gly Phe His Glu Arg Gly Gln Asp Trp Glu Gln Thr Gln Lys
                165                 170                 175
Ile Tyr Asn Cys His Val Leu Leu Asn Ser Lys Gly Ala Val Val Ala
            180                 185                 190
Thr Tyr Arg Lys Thr His Leu Cys Asp Val Glu Ile Pro Gly Gln Gly
        195                 200                 205
Pro Met Cys Glu Ser Asn Ser Thr Met Pro Gly Pro Ser Leu Glu Ser
    210                 215                 220
Pro Val Ser Thr Pro Ala Gly Lys Ile Gly Leu Ala Val Cys Tyr Asp
225                 230                 235                 240
Met Arg Phe Pro Glu Leu Ser Leu Ala Leu Ala Gln Ala Gly Ala Glu
                245                 250                 255
Ile Leu Thr Tyr Pro Ser Ala Phe Gly Ser Ile Thr Gly Pro Ala His
            260                 265                 270
Trp Glu Val Leu Leu Arg Ala Arg Ala Ile Glu Thr Gln Cys Tyr Val
        275                 280                 285
Val Ala Ala Ala Gln Cys Gly Arg His His Glu Lys Arg Ala Ser Tyr
    290                 295                 300
Gly His Ser Met Val Val Asp Pro Trp Gly Thr Val Val Ala Arg Cys
305                 310                 315                 320
Ser Glu Gly Pro Gly Leu Cys Leu Ala Arg Ile Asp Leu Asn Tyr Leu
                325                 330                 335
Arg Gln Leu Arg Arg His Leu Pro Val Phe Gln His Arg Arg Pro Asp
            340                 345                 350
Leu Tyr Gly Asn Leu Gly His Pro Leu Ser Xaa Asp Leu Thr Ser Val
        355                 360                 365
Ser Leu Asp Leu Pro Leu Pro Pro Pro Pro Cys His Tyr Glu Leu Val
    370                 375                 380
Leu Met Xaa Leu Gly Gly Arg Ile Gln Ala Gln Leu Pro Ser Leu Gly
385                 390                 395                 400
Glu Pro Xaa Leu Ser Xaa Trp Asn Thr Asp Gly Leu Leu Gly Lys Glu
                405                 410                 415
Thr Phe Thr Xaa Ala Ser Pro Glu Val Arg Leu Gln Phe Gln Lys Gly
            420                 425                 430
Gly Ile Leu Tyr Ser His Cys Leu Phe His Gly Asn Xaa Ser Ser Ala
        435                 440                 445
Glu Gly Xaa Ala Ala Leu Ala Leu Lys Asn Ile Ile Ile Ile Lys Ser
    450                 455                 460
Lys Lys Lys Lys Lys Lys Lys
465                 470
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